

REMARKS

In the Office Action, the Examiner rejected claims 1-3, 5-9, and 13 pursuant to 35 U.S.C. § 102(b) as anticipated by Sumanaweera, et al. (U.S. Patent No. 5,967,987). Claim 1 was rejected pursuant to 35 U.S.C. § 102(b) as anticipated by Darrow, et al. (U.S. Patent No. 5,255,680). Claims 4, and 10-12 were rejected pursuant to 35 U.S.C. § 103(a) or unpatentable over Sumanaweera, et al. Claims 14 and 15 were rejected pursuant to 35 U.S.C. § 103(a) as unpatentable over Sumanaweera in view of Melton, Jr., et al. (U.S. Patent No. 5,373,848). Claims 23 and 24 were rejected pursuant to 35 U.S.C. § 103(a) as unpatentable over Sumanaweera, et al. in view of Hossack, et al. (U.S. Patent No. 6,083,168). Applicants respectfully request reconsideration of the rejections of claims 1-15 and 23-24, including independent claim 1.

Independent claim 1 recites automatically altering a scan plane position relative to a transducer as a function of the motion. Sumanaweera, et al. and Darrow, et al. do not disclose this limitation.

Sumanaweera, et al. have the user orient the transducer (col. 5, lines 62-66). This manual positioning is not automatic alteration.

Sumanaweera, et al. orient the transducer (col. 5, line 62). To image a desired location, the transducer is moved (col. 5, line 62 - col. 6, line 6). Sumanaweera, et al. use the well-known scan plane fixed relative to the transducer, so move the transducer to move the scan plane. Sumanaweera, et al. do not alter the scan plane position relative to the transducer.

Darrow, et al. track an invasive device (col. 7, lines 29-31). To image the invasive device, the subject is placed and aligned (col. 7, lines 26-29). The arm position and field of view are stored (col. 7, lines 31-33). When the invasive device moves outside the field of view, the arm is moved relative to the table supporting the patient (col. 7, lines 33-38). The x-ray source 103 and detector 105 are mounted on the arm (col. 2, lines 58-65), so are moved relative to the patient on the bed to change the position of the field of view. Rather than move a field of view relative to the x-ray source or detector, Darrow, et al. move the x-ray source and fixed

field of view relative to the patient. Darrow, et al. do not alter a scan plane relative to a transducer.

Dependent claims 2-15 and 24-25 are allowable for the same reasons as independent claim 1. Further limitations patentably distinguish from the cited references.

Claim 2 recites tracking by performing cross-correlation or sum of absolute differences. The cited portion of Sumanaweera, et al. discloses correlation to detect average velocity (col. 6, lines 28-36), not to track motion in a region.

Claim 3 recites tracking by comparing data from different acquisitions. Sumanaweera, et al. determine orientation and calculate volume flow from flow information, but do not track motion by comparing data.

Claim 6 recites tracking motion within a volume, and maintaining the scan plane at a region of interest in the volume. Sumanaweera, et al. manually adjust scan plane position and then take measurements. There is no tracking within a volume.

Claim 8 recites tracking motion by transmitting to at least three sub-regions of a volume. Sumanaweera, et al. do not track by transmitting to sub-regions.

Claim 13 recites tracking motion of a feature. The Examiner cites to placement of a spectral Doppler gate, not tracking a feature.

Claim 10 recites transmitting three grouped sets of beams in a volume. Sumanaweera, et al. are concerned with a cross-sectional plane of a vessel and use manual positioning to scan the plane. Motion in a volume does not matter to Sumanaweera since the cross-section of a vessel is all that is needed.

Claim 12 recites shifting images as a function of an initial position. Sumanaweera, et al. measure volume flow, which is the same at different cross-sections of the vessel. There is no reason to shift in Sumanaweera, et al. Conversion to Cartesian coordinate format does not shift an image as a function of an initial position of a region, but only converts polar coordinate samples to a display format.

Claim 14 recites tracking speckle or spatial gradient. Melton, et al. disclose a spherical interrogation volume, symmetric with respect to spatial gradient. Melton, et al. do not track the gradient.

Claim 15 recites adjusting a tracking parameter as a function of position. The cited portion of Melton, et al. does not track or adjust a tracking parameter.

The Examiner does not cite to altering a volume position of claim 25 in Hossack, et al.

The motion sensing of Hossack, et al. would not have been used with the volume flow of Sumanaweera, et al. Hossack, et al. sense motion between images while Sumanaweera, et al. find flow information from different scans to calculate volume flow. Motion between images is not needed and does not contribute to volume flow calculation.


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Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (650) 943-7554 or Craig Summerfield at (312) 321-4726.

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